REMARKS

The Official Action mailed July 10, 2003, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant has not received acknowledgment of the Information Disclosure Statement filed on May 18, 2001. The Applicant respectfully requests that the Examiner provide an initialed copy of the Form PTO-1449 evidencing consideration of this Information Disclosure Statement.

Claims 1 and 2 are pending in the present application, both of which are independent. Claims 1 and 2 have been amended to better recite the features of the present invention and to correct minor informalities. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 1 of the Official Action objects to claims 1 and 2 and suggests replacing "and" with "an." In response, the Applicant has amended claims 1 and 2 to recite, among other features, a receiver comprising a demodulation means, a reception signal phase rotation angle detection means, and an inverse phase rotation means. These amendments are merely clarifying in nature, and should not in any way affect the scope of protection afforded the claims for infringement purposes, particularly under the Doctrine of Equivalents. Accordingly, reconsideration and withdrawal of the objections are in order and respectfully requested.

Paragraph 3 of the Official Action rejects claims 1 and 2 as obvious based on the combination of U.S. Patent No. 6,023,491 to Saka et al. and U.S. Patent No. 5,832,043 to Eory. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present invention, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Saka and Eory do not teach or suggest an inverse phase rotation means for inversely rotating a phase of the I and Q symbol stream data output from said demodulation means by a phase rotation angle (OR(3)) detected by said reception signal phase rotation angle detection means, thereby performing absolute phasing.

The present invention is described in the specification of the subject application as follows (emphasis added):

> A reception signal phase rotation angle detection circuit (8C) detects the phase rotation angle corresponding to a bit "1" of a frame sync signal of a received symbol stream from $\Delta\Phi(3)$ and the MSB of the output I' of the remapper (7) and outputs the phase rotation angle to the remapper (7) to allow the remapper (7) to perform absolute phasing. The selector (16C) reads phase error data corresponding to the received symbol data after

absolute phasing output from the remapper (7) from the phase error table corresponding to the modulating method identified by a transmission configuration identification circuit (9).

See specification at abstract.

The present invention relates to a receiver for receiving PSK modulated signals of digital signals which are modulated by a plurality of PSK modulation methods having different phase numbers such as two and eight phases, two and four phases, four and eight phases, or two and four and eight phases, particularly by hierarchical transmission methods, and which are multiplexed in time, and for demodulating the PSK modulated signals by using carriers reproduced by a carrier reproduction unit to output I and Q symbol stream data.

Id. at page 1, lines 5-13.

With the above-described conventional receiver, in order to correct the phase of the reference carriers f_{c1} and f_{c2} during the demodulation of QPSK modulation, two phase error tables 14-1 and 14-2 are required, and in order to correct the phase of the reference carriers f_{c1} and f_{c2} during the demodulation of BPSK modulation, three phase error tables 15-1 to 15-3 are required. A memory capacity required therefore becomes large.

Id. at page 26, line 24 to page 7, line 5.

In the receiver shown in Fig. 10, the carrier wave reproduction circuit has seven phase error tables 13, 14-1, 14-2, and 15-1 to 15-4, and the I and Q symbol stream data I(8) and Q(8) from the demodulation circuit are input to the phase error tables. In the receiver shown in Fig. 10, only three phase error tables 13, 14-1 and 15-1 are used, and the I and Q symbol stream data I'(8) and Q'(8) from the remapper 7 are input to the phase error tables.

Id. at page 31, lines 14-20.

According to the invention, the phase error data corresponding to the I and Q symbol stream data after the absolute phasing by an inverse phase rotation means is read from the phase error table of a carrier reproduction means. Accordingly, irrespective of what value the reception signal phase rotation angle takes, the received signal point of the I and Q symbol stream data input to the phase error table becomes coincident with that on the transmission side. A signal phase error table of a carrier reproduction means can be provided for each modulation method. The number of phase error tables in the carrier reproduction means can be reduced and the circuit scale can be simplified considerably.

Id. at page 65, line 19 to page 66, line 4.

As disclosed in the specification, the present invention provides a digital receiver which demodulates a PSK modulated signal obtained by modulating digital signals with a plurality of PSK modulation schemes having different phase numbers and time-multiplexing them, where a remapper 7 (e.g. inverse phase rotation means) inversely rotates a phase of received symbol data to perform absolute phasing, and where phase error data corresponding to the received symbol data after absolute phasing is read from the phase error table to correct a phase of a carrier wave using the read phase error data.

The present invention having the above features has a specific technical advantage, i.e. a necessary capacity of memory can be largely reduced as compared to the prior art because it is sufficient to provide only one phase error table for each of the PSK modulation schemes.

The Official Action concedes that Saka does not teach "an inverse phase rotation means for inversely [rotating] a phase" (page 3, Paper No. 4). Saka only discloses a receiver apparatus that demodulates a single modulated wave (e.g. QPSK signal). Therefore, Saka does not recognize the problem in the prior art, i.e. that a memory capacity becomes larger, because a plurality of phase error tables must be provided for each of the plurality of modulation schemes. The present invention confronts and intends to solve the above-referenced problem in the prior art. Accordingly, Saka does not teach any solution to the problem. Therefore, Saka does not disclose an inverse phase rotation means for inversely rotating a phase of symbol data to perform absolute phasing.

Eory does not cure the deficiencies in Saka. The Official Action relies on Eory to allegedly teach "a complex multiplier for inversely [rotating] a phase" (page 4, Id.). It appears that the Official Action alleges that Eory teaches a component (complex multiplier 55) corresponding to the "inverse phase rotation means" of the present invention. The Applicant respectfully disagrees that the complex multiplier 55 of Eory is

the same as the inverse phase rotation means, e.g. remapper 7, of the present invention. Eory does not teach or suggest that the complex multiplier 55 is for inversely rotating a phase of symbol data to perform absolute phasing. Therefore, Saka and Eory, either alone or in combination, do not teach or suggest an inverse phase rotation means for inversely rotating a phase of symbol data to perform absolute phasing.

For at least the reasons stated above, the Applicant respectfully submits that the complex multiplier 55 of Eory does not teach or suggest an inverse phase rotation means for inversely rotating a phase of the I and Q symbol stream data output from said demodulation means by a phase rotation angle (OR(3)) detected by said reception signal phase rotation angle detection means, thereby performing absolute phasing. Since Saka and Eory do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Saka and Eory or to combine reference teachings to achieve the claimed invention. The Official Action asserts that "[it] would have been obvious to one of ordinary skill in the art to implement the teaching of Eory into [Saka so] as to provide positive and negative frequencies with continuous [phase] for accommodating bi-directional frequency conversion in near-zero IF digital receivers as taught by Eory" (page 4, Paper No. 4, citing Eory at col. 7, lines 3, 13-15). The Applicants respectfully disagree. The alleged motivation to combine in Eory appears to relate to the digital rotating complex phasor generator 60, and not to the complex multiplier 55. Also, nothing in either Saka or Eory teaches or suggests how or why one with ordinary skill in the art would combine Eory and Saka. It appears that the Official Action implies that it would have been obvious to somehow substitute the complex multiplier 55 of Eory for the complex multiplier 11 of Saka. Nothing in either reference teaches or suggests such a combination. In any event, neither Eory nor Saka teach or suggest an inverse phase rotation means and absolute phasing. Therefore, the Applicants respectfully submit that

there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Saka and Eory or to combine reference teachings to achieve the claimed invention.

Even assuming motivation could be found, the Official Action has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable expectation of success when combining Saka and Eory. Specifically, it is not clear whether the complex multiplier 55 of Eory would function if it were placed into the device of Saka.

The Applicants further contend that even assuming, *arguendo*, that the combination of Saka and Eory is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the present application, it is respectfully submitted that the prior art of record, alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,

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